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DEFINING THE BASIS OF VALUE IN LAND VALUE TAXATION

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ABSTRACT

Recurrent land taxes are an important revenue source for sub-national government internationally and are assessed on a number of different bases of value. This paper examines the various bases of value on which this tax is assessed internationally then focuses on the valuation of land, being the dominant basis of value used to assess this tax in Australia.

Valuation experiments are used to examine the valuation practices of valuers in highly urbanized locations where vacant land sales are rare. It demonstrates the challenges of using value as the base of this tax and in particular land or site value used in Australia. The paper concludes that while issues exist in the determination of any basis of value, the practices of valuers are most important in the determination of a consistent and neutral base on which to assess the tax.

Keywords: Land Value, Capital Improved Value, Highest & Best Use

INTRODUCTION

Recurrent land taxation commenced in South Australia in 1884. At the time of Federation in 1901, this tax was imposed by all three levels of government in some States. New South Wales vacated taxing land in 1906, strengthening local government's opportunity to collect this tax in conjunction with the Commonwealth, now known as council rates (Simpson and Figgis, 1998). In 1942 the Commonwealth removed the States powers to collect income taxes and ceased imposing land tax in 1952, allowing the States to resume collection of this tax in conjunction with local government, (Smith, 2005). A dual state and local government recurrent land tax exists today across the six States of Australia. Northern Territory imposes council rates but does not impose a Territory land tax.

In contrast to many OECD countries, where recurrent land taxation predominantly operates as a local government tax, within Australia it operates at the local and state government level on a variety of different bases of value. The dual imposition of this tax by state and local government in Australia has advantages over its sole imposition by local government in other countries, where the evolving rationale has become a perceived quid pro quo tax for services provided. While a taxpayer rationale exists for rates and services at the local level, no such rationale exists for state land tax in Australia, which is more aptly viewed as a consolidated revenue tax.

BASES OF VALUE WITHIN AUSTRALIA

When land tax was introduced in Australia it was assessed on the unimproved capital value (UCV) of land, meaning the value of land in its en-globo or original untouched state. Through the progression of time, as more land became urbanized and was the subject of clearing, excavation, leveling and retention, UCV became less relevant and by 1990, five States had moved to either Land Value (LV) or Site Value (SV) as the base of state land tax. In 2010 Queensland was the last state to move from UCV to SV for the assessment of state land tax as per Table 1.

Recurrent land tax is assessed on a number of different bases across Australia of which local government in some states have options to assess rates on more than one basis of value. In the States of South Australia and Victoria rates are predominantly determined on Capital Improved Value. As set out in Table 1, the labels and bases of value vary from state to state in the imposition of this tax. Despite some states having the same label of value, i.e. site value is used in Victoria and Queensland, however different statutory definitions of value within State Valuation of Land legislation exist in each of these States.

Table 1: Bases and premise of value used to assess recurrent land taxes

Stamp Duty (Transfer Tax)		
Basis of value	**Application of the tax**	
Market value or transfer price of the property, whichever is the higher.	Tax imposed by each State in Australia which applies to the purchase of property. It is a consolidated revenue tax and not earmarked to any service or purpose.	
Land Tax (Recurrent Tax)		
State	**State Govt Land Tax**	**Local Govt Council Rates**
New South Wales	Land Value	Land Value
Queensland	Site Value	Site Value
Victoria	Site Value	Improved Value
South Australia	Site Value	Improved Value *
Western Australia	Site/Unimproved Value	Gross Rental Value *
Tasmania	Land Value	Gross Rental Value *
Northern Territory	N/a	Unimproved Capital Value
ACT	Unimproved Value	Unimproved Value
Perceived objective/purpose	General purpose or consolidated revenue tax	Quid pro quo tax for local services provided
Value premise	Market value of the land which includes land improvements as defined within various state valuation of land statutes, i.e. excavation, retention, filling and servicing of land.	
Valuation Method	Direct comparison where vacant land sales exist. Paired sales analysis and cost method with the use of improved sales.	

Sources: State Valuation of Land legislation across Australia

***Denotes the option of assessing council rates on more than one basis across different LGA's.**

BASES OF VALUE - INTERNATIONAL

The two broad bases on which the property tax is assessed internationally are area and value. Typically, area-based taxation applies in countries where property markets are evolving or information systems are not well-developed to support a value based system (RICS 2007). Under an area based system, 'a charge is levied per square meter of land area, per square meter of building or sometimes a combination of the two (Bird and Slack 2004).

In contrast to area, value based land taxes are divided into three broad categories. The first is capital improved value (CIV), the second, being income or annual rental value (ARV) and the third being land value (LV) or site value (SV). Value based assessments are those determined from the market place, 'being a price that would be struck between a willing buyer and willing seller in an arms-length transaction' (Ibid:28).

The most common base on which land tax is assessed is capital improved value (CIV), followed by Area, Annual rental value, while in contrast, land value (LV) is ranked fourth being one of the least commonly used basis of value. Despite this fact, few of the countries that use CIV have transitioned from other bases of value, with CIV being the original base of the property tax in those countries (McCluskey *et al*, 2010). A review of each of these bases of value follows, in which the strengths and limitations of each are examined.

Capital Improved Value (CIV)

CIV may constitute a combined value for a single assessment, or may comprise separate rates for each element of land and buildings, which allows a differential or split rate to be applied (McCluskey *et al* 2010:121). CIV is

stated to get around a number of practical and conceptual problems that impact on alternate bases of value including rental value and land value systems (Bahl, 2009:7). In some applications CIV rates poorly on the principle of economic efficiency in jurisdictions where market value and hence highest and best use are not always used.

In parts of the US, improved value is based on the initial purchase price of property, with a cap on the increase of the rate revenue raised from the property. In California where improved value is used, Proposition 13 was introduced in the 1970s to cap increases in the property tax at two per cent per annum, in which the initial purchase price of property is indexed annually. In determining the impact of this on efficiency, owners who had their property compulsorily acquired by the Metro Water District of Southern California, were compensated 28 times the improved value used to assess their property tax, (Gaffney, 1995).

In England, residential property is taxed on CIV, in which property is banded into groupings based on its improved value. The value of property was initially determined in 1993, with no subsequent revaluation undertaken since that date, in which the base of the tax no longer bears relevance to market value (Plimmer 1998). Further, there is no geographic distinction for changes in the relativity of value across locations in England at present.

In Germany where property is taxed on CIV, the values used for the property tax were determined in 1964 in the former Federal Western States and in 1935 in the former East Germany (Maximilian 2012). In France, where CIV is also the base of the property tax, the values used to assess the tax are circa 1970. Like Germany, France also uses historic values to assess the property tax in which increases in tax revenue are determined by adjustment to the rate applied to the 'map, also known as the cadastre value,' (pers. comm. Bloechliger 2012).

In other cases, market value and highest and best use is the base on which CIV is determined. Sweden uses CIV to assess the property tax in which property values are reassessed every three years. Sweden adopts a 'Physically Defined Standard State', (PDSS) for land and buildings by location, in which improvements are defined to a specific standard state by location across the country, this standard state is the proxy for highest and best use in which improvements are determined as being maximally productive and as new, (pers. comm. Lind, 2010).

In Canada CIV represents market value, unencumbered (Bird and Slack 2004:70). To this end, a robust and definitive basis of value has evolved and is continuing to evolve as Canada leads the way in the assessment of value under CIV. While property tax reforms in Ontario are ongoing, it has been successful in implementing a uniform assessment system (Bird, Slack and Tassonyi, 2012:224), however it is not clear whether a Standard Defined State is used to establish the highest and best use of CIV in Canada.

New Zealand has a well developed rating system in which local government has the option of adopting one of three bases of value for the rating of property, (McCluskey *et al* 2006:381). Four of the main cities of New Zealand (Auckland, Wellington, Christchurch and Hamilton) all utilize a capital or annual value rating system, (Ibid:389). The property tax is applied at the local government level in New Zealand, to which the local government determines a rate in the dollar which is applied to the CIV to assess the tax.

Denmark imposes a recurrent tax on property on a number of bases which includes CIV which was introduced in 2000. CIV is the based used to tax owner-occupied dwellings and summerhouses and is assessed on market value of which values are re-assessed bi-annually in line with market transactions. The transition to CIV for residential property is currently evolving during 2013 in which a 'Standard Defined State' is being developed for the basis on which CIV is to be determined, similar to Sweden, (pers. comm. Falk-Rasmussen, 2010 & 2012).

Annual Rental Value (ARV)

Annual Rental Value (ARV) is derived from the annual income of improved property and is generally determined on the net annual rental after outgoings are deducted from the gross rent (McCluskey, Owiti and Olima 2005:11). In contrast, examples of Gross Rental Value may be used comprising the total rent collected, inclusive of property outgoings (McCluskey *et al* 2010). Its two advantages are stated to be its application to a broader base, namely land and buildings, and its ease of assessment by reference to income from the property, (McCluskey *et al*, 2005:11).

Similar to CIV, ARV is influenced by the condition, age and functionality of the improvements on the land, and may impact on the efficiency of the tax where improvements are not maximally productive. The core factor of location may be impacted on by improvements, particularly where they are not assessed on highest and best use or maximally productive. The key differentiating factor between capital bases of taxation including improved and land value compared with assessed annual value, is that capital value and the analysis of capital value transactions will capture both the investor and owner-occupier market. This is in contrast to ARV assessments, which are derived from the investment segment of the market only (Whipple 1986).

The rental approach may present its own valuation problems in cases of properties that are not in the rental marketplace, such as owner-occupied property (Bahl 2009:6). The valuation problem also extends to the valuation of vacant land, where a rental is not determinable due to the absence of improvements on the land (Ibid:6). In cases where rental data is thin or non-existent, reference to average rents paid are assumed of which these rents are roughly reflected in the rental roll (Ibid:7).

The above opens the debate as to whether the tax is assessed on the actual rental from the property and where that differs from rent based on highest and best use, which should be used to assess the tax. The Uniform Business Rate used to assess non-residential property in the UK does not articulate this detail. Where a property is vacant, a hypothetical landlord and hypothetical tenant is assumed (Sanderson 2012), however what is not known in these circumstances which may impact on the efficiency of the tax, is whether proxy for highest and best use is applied where a property is rented but its rent is below market rent.

Different jurisdictions have adopted different approaches to address the matters discussed above. In the Netherlands, a mix of capital value deduced from property transactions as well as rental values from rental information is used in the assessment of the property tax. The rental component is better known as imputed rent or rental value (Kathmann and Kuijper 2010). The imputed rental value is obtained from the market derived from other comparable rented premises, while the capital improved value is derived from sales which encompasses both owner-occupied and rented segments of the market.

In Australia ARV and specifically Gross Annual Value (GAV) is used to assess local government rating in the States of Western Australia, (WA) and Tasmania (Tas). In contrast to England, Hong Kong and the Netherlands where the annual rental value is determined on the net rent after deducting outgoings, in WA and Tas, local rates are assessed on GAV.

Land / Site Value

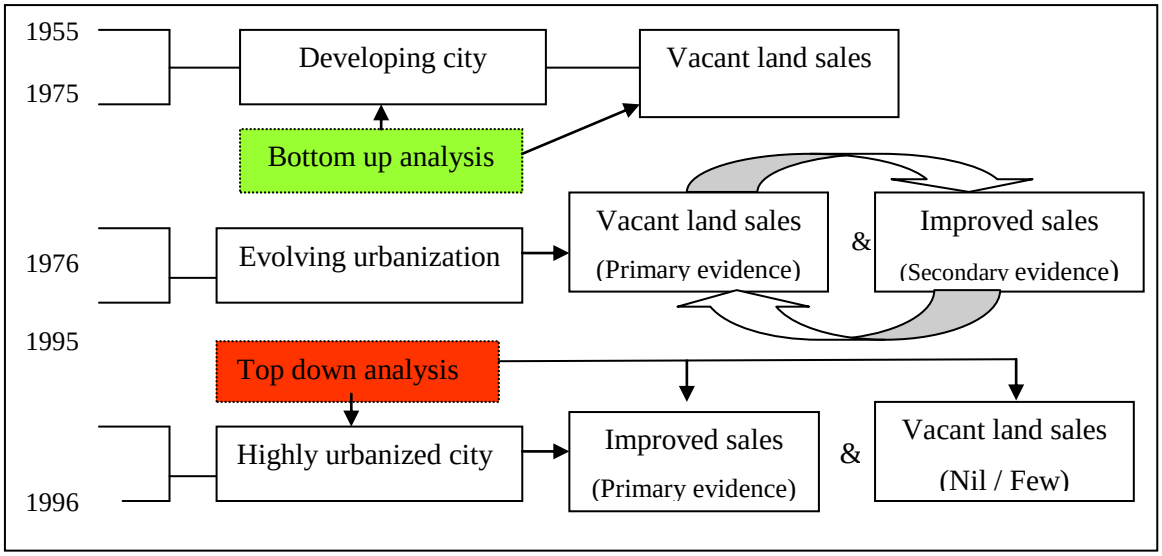
Land and site value, is broadly defined in Valuation of Land legislation as excluding improvements on land. Considerable confusion surrounds the measurement in practice of land value and in particular its determination on highest and best use. In the early twentieth century, the use of land value as the basis of taxing property was determined on the sufficiency of undeveloped (unimproved or vacant) land sales as the basis for assessing value (McCluskey, *et al* 2010:122). This approach was underpinned by the fact that vacant land transacts reflected the potential highest and best use of land. However, with the development of highly urbanized locations where vacant land sales have become the exception, valuers could no longer rely on vacant land sales as a measure of land values (Ombudsman 2005).

The evolution of land taxation in Sydney (Australia) provides an insight into the challenges confronting all cities when imposing a land tax in increasingly urbanized locations. Figure 1 outlines how the increasing lack of vacant land sales as the source of primary evidence for determining land value, has resulted in greater reliance on improved property sales. This has resulted in an additional layer of complexity which requires accounting for the added value of improvements in the valuation of land (Ombudsman 2005:7). With this has come a lack of 'transparency' and 'simplicity' and increasing pressure for the adoption of alternate bases of value for the assessment of recurrent property taxation. The lack of land transactions on these two principles of 'good tax design' are clearly defined as the rationale for the move to CIV in other international jurisdictions (Franzsen, 37 and 41, in Dye and England eds. 2009).

The lack of consistency in accounting for the added value of improvements and the inability for valuers to articulate how land value has been determined from improved value has raised questions as to whether land remains the most suitable base on which to assess the property tax in highly urbanized locations. What is clear from the earlier review of the historical evolution of property taxation is that land tax is constantly under challenge and constantly in terms of the base on which it is assessed.

One consequence of the lack of sufficient vacant land transactions in a particular location has resulted in the practice of valuers being forced to use land transactions from adjoining locations (Bahl 2009:9). Another practice has been for land value to be determined by deducting the added value of improvements from improved property sales. (Ombudsman 2005). This emerging valuation process and in particular, the determination of the added value of improvements on land value, has raised questions about its potential to compromise the economic efficiency, simplicity and transparency of land tax (Arnott & Petrova 2002:3).

Figure 1: Evolution of value in the Sydney Basin



The challenges confronting valuers in valuing land in highly urbanized locations is apparent in this section, however, what is not known, is which specific elements of the valuation process do valuers find most challenging and where do they differ in practice in undertaking valuations of land in highly urbanized locations. The following section sets out the research methods used to examine the valuation process and factors that influence the practices of valuers used to value land. This is followed by a summary of the results which contribute to explaining the rationale of valuers and where they differ in their valuation approach.

RESEARCH METHOD AND RATIONALE

In testing the valuation practices used by valuers in valuing land for rating and taxing purposes in the absence of vacant land sales, two valuation simulations also known as experiments were developed. In the social sciences, an experiment in the form of a hypothetical scenario is used to monitor and test outcomes of a particular situation and transports the key aspects of a situation to an experiment setting (Jones 1996).

The first experiment comprised a main street retail strip with shops and one level of offices above, the second comprised a residential street with single dwelling houses. The properties in each experiment are located in land zoned for their existing use. Each of these two experiments comprised an initial and revised task with each experiment carried out by 23 valuers, of which the objective of the experiments was to measure the consistency across the valuers in valuing land in the absence of vacant land sales.

In both of the initial experiments there is a void of vacant land sales, with valuers being given three improved sales with improvements at varying degrees of dilapidation. One sale in each experiment had improvements that were structurally and cosmetically refurbished within the past seven years. The second sale in each experiment had improvements similarly refurbished approximately 15 years ago. The third sale in each experiment was dilapidated, requiring total refurbishment and upgrade. The sale price, date, use and occupancy details were provided to valuers, as well as the cost $\$/m^2$ new for property in both experiments.

The primary tasks of the initial phase of the experiment are for valuers to:

1. Determine the land value of each of the three sales;
2. To observe the order of sale in each experiment valuers determined to be the most relevant to least relevant in determining a basis of land value; and
3. To observe which sale did valuers determine as being in the most valuable location.

Once the initial experiment was complete, valuers then re-answered the first step above, however were provided with an additional sale of a fully refurbished property (structurally and cosmetically) in each experiment which had sold within 12 months of the date of valuation.

Table 2 sets out the responses for both the experiments and as noted, the completed experiments of 25 does not correspond with the number of valuer participants for either the retail or residential experiment. In total 25 valuers participated in the experiment of which 23 of the valuers completed both the retail and residential experiments. Two additional valuers completed the retail experiment only and an additional 2 valuers completed only the residential experiment.

The specific questions to be examined, however, are: Where improved sales are used to determine land value for rating and taxing purposes, which sales do valuers consider most relevant, which improved sales yielded the most consistent results and does a codified process for selecting and analyzing improved sales result in a more consistent value?

The analysis and tests used to measure the change between the results from the initial and revised experiments are firstly by comparing change in the standard deviation for each sale in both experiments across the valuers. This is followed by a non-parametric Levene test using SPSS software to measure the significance of the variations of each sale across the groups of valuers. The Levene test ranks transformation as a bridge between parametric and nonparametric statistics using three steps, "(i) pooling that data and replacing the original scores by their ranks and then (ii) separating the data back into their groups and three applying the conventional mean based Levene test to the ranks" (Nordstokke *et al* 2011:3). The summary of results for the experiments and Levene tests are set out as the annexure to this paper.

Table 2: Experiment response rate

Response Type	Retail	Residential
Gross experiment sample	40	40
Completed/returned experiments	23	23
Total completed & returned experiments	46	
Non-returned	13	12
Returned & incomplete	4	5
Net responses	23	23
Response rate completed & returned	57.5%	57.5%

Retail Experiment Results

A review of the standard deviations of the three sales in the initial experiment shows that all three sales are within the acceptable margin of error of +/- 15 per cent. This margin is used within rating and taxing valuation practice, (NSW Ombudsman 2005). 20 Main Street resulted in a standard deviation of 8.19 per cent, 5 Bank Rd, 9.79 per cent and 15 Main Street 10.18 per cent. A summary of these results are included in Table 3.

In adopting a codified approach to the analysis in accounting for the added value of improvements a different outcome resulted across all three sales in the revised experiment. 15 Main Street resulted the lowest standard deviation of 4.44 per cent and the largest improvement of 56.4 per cent of the three sales in the revised experiment. This was followed by 5 Bank Rd resulting in a standard deviation of 6.52 per cent, an improvement of 33.5 per cent and finally 20 Main Street resulted in a reduction of the standard deviation to 5.97 per cent, an improvement of 27.2 per cent.

A review of the results from the second task of the initial experiment qualifies the processes and judgment adopted by the valuers in the sales selection process. As set out in Table 3, a review of the sale valuers ranked as the most relevant in deducing the underlying value of land was 20 Main Street. 17 of 23 valuers representing 73.9 per cent selected 20 Main Street as the most relevant, followed by 6 valuers representing 26.1 per cent, who selected 15 Main Street as the second relevant sale. 5 Bank Street was not selected by valuer as the most relevant sale.

The third task valuers were instructed to undertake, was to rank the most valuable to least valuable location of the three sales. It is reiterated that all of the parcels of land are the same size and shape and sold within the same time period, close the date of valuation. Once the added value of improvements are accounted for and deducted from the sale price, the deduced land value ultimately reflects the value of the location of the land. It is noted in Table 3, that 7 valuers, representing 30.4 per cent, did not assign the highest land value to the property selected as the most valuable location in the initial experiment.

Results from the Levene test highlight significance of variance of both 15 and 20 Main Street, with the largest variation of these two, being 15 Main at .002. As set out in the information provided to the participants of the retail experiment, 15 Main Street had the newest improvements of the three sales. The provision of the additional sale in the revised experiment, which was near new, has resulted in the greatest variation and significance. The result confirms that sales with improvements that are highest and best use and require little adjustment for depreciation of improvements produce the largest improvement and result in the lowest standard deviation. The significance of 20 Main Street resulted from valuers being able to confirm that the added value of improvements and cost new are the same hence graded the land value for 20 Main Street from the land value deduced from the revised valuations of 15 Main Street and the additional sale at 22 Main Street.

Residential Experiment Results

A review of the standard deviations of the three sales in the initial experiment shows that only one of the three sales, 20 Fiction Street, resulted in a standard deviation of 11.2 per cent, being within the acceptable margin of error of +/- 15 per cent. 10 & 15 Fiction Street resulted in standard deviations of 17 percent and 16.4 per cent respectively. The summary of the results are included in Table 4.

In adopting a codified approach to the analysis in accounting for the added value of improvements a different outcome resulted across all three sales. 10 Fiction Street produced the lowest standard deviation of 10.3 per cent and the largest improvement of 39.4 per cent of the three sales in the revised experiment. This was followed by 15 Fiction Street resulting in a standard deviation of 12.6 per cent, an improvement of 23.2 per cent. In contrast,

20 Fiction Street resulted in a reduction in the standard deviation to 13 per cent, however, it was still within the acceptable margin of error of +/-15 per cent.

A review of the results from the second task of the initial experiment qualifies the processes and judgment adopted by the valuers in the sales selection process. As set out in Table 4, a review of the sale valuers ranked as the most relevant in deducing the underlying value of land was 20 Fiction Street. 15 of 23 valuers representing 65.2 per cent selected 20 Fiction Street as the most relevant, followed by five valuers representing 21.7 per cent, who selected 10 Fiction Street as the most relevant sale. 15 Fiction Street with three valuers or 13 per cent, was selected this as the most relevant sale.

The third task valuers were instructed to undertake, was to rank the most valuable to least valuable location of the three sales. It is reiterated that all of the parcels of land are the same size and shape and sold within the same time period, close the the date of valuation. Once the added value of improvements are accounted for and deducted from the sale price, the deduced land value ultimately reflects the value of the location of the land. It is noted in Table 4, that 11 valuers, representing 47.8 per cent, did not assign the highest land value to the property selected as the most valuable location in the initial experiment.

Results from the Levene test highlight significance of variance of 10 Fiction Street at .029. As set out in the information provided to the participants of the retail experiment, 10 Fiction Street has both the newest and largest improvements of the three sales. The provision of the additional sale in the revised experiment, which was near new, has resulted in the greatest variation and significance being attributed to the sale with the newest improvements. Similar to the retail experiment, the result confirms that sales with improvements that are highest and best use and require little adjustment for depreciation of improvements produce the largest improvement and result in the lowest standard deviation.

Results Summary

The results of the experiments highlight three important points as follow:

1. Valuers to some degree differed on which sale was considered the most relevant of the three sales in each experiment. The majority of valuers gravitated towards the sale with the oldest improvements with lowest added value to the land in each case. In the residential experiment 65 per cent of valuers selected 20 Fiction Street as the most relevant sale and in the retail experiment 74 per cent of valuers selected 20 Main Street as the most relevant sale. This demonstrated that valuers preferences were to adjust back to land value, sales with improvements which added little value to the land.
2. In the second task of valuers determining the most valuable location of the three sales, valuers were split (not equally) across the sales in each experiment, however a more even split is noted in the residential experiment. It was suggested by some participating valuers that a rental survey would best reflect the location value of land, particularly in the retail experiment. Of particular note in results on this task, was that in the initial retail experiment, 7 of the 25 land values, or 28 per cent, selected as the most valuable location were not assigned the highest land value of the three sales. In the initial residential experiment, 11 or 23 land values, or 47.8 per cent selected as the most valuable location were not assigned the highest land value of the three sales.

3. The most significant factor which emerged was the improvement in the standard deviation of values between the initial and revised experiments in both the residential and retail results. This demonstrated that a codified approach in which valuers agreed on the same sales as being most relevant and with a standard approach to analyzing these sales, the improvement in the standard deviation of values ranged from 23 to 56 percent. It was noted that one sale 20 Fiction Street had a decrease of 16 per cent in the standard deviation of its value.

CONCLUSION

The definition of value is a well defined concept within the property profession. However, within taxation the meaning of value is subsumed under the principles of 'good tax design' particularly in assessing land tax. In summary, the value determined and used to assess recurrent property tax is an artificial construct resulting from a manufactured process in the absence of vacant land sales.

While requiring some resemblance to market value as defined in Spencer v Commonwealth 1907, the standard defined state of value and its manufacture is the key to an economically efficient recurrent land tax in Australia. This brings to the fore, the importance that all bases of value are assessed on the same footing and more specifically, all land or property in the case of capital improved value or assessed annual value are assessed on the same footing, that is highest and best use and not existing use.

In the first instance, it has been observed that the success of taxing land on its highest and best use depends largely on the valuation practices adopted (Gaffney, 1975, Hudson, 2008 & Oates & Schwab 1997). If land value is to remain the basis of recurrent land taxation, it will be necessary to ensure that valuers firstly define the land's highest and best use before the added value of improvements can be determined in a simple and transparent manner and improve the economic efficiency of the tax. A framework for determining the highest and best use of land therefore has the potential to facilitate the application and harmonization of a recurrent tax on land within and across jurisdictions of Australia.

The primary rationale argued for land over other bases of value, is that improvements are accounted for in the sales analysis process when valuing land. This is in contrast to including improvements in the tax base and hence attempting to communicate to the tax payer that CIV, is not what is on their land, but should be on their land where improvements are not maximally productive.

The conclusion drawn is that a codified process of selecting, analyzing and determining value (aka the valuation process) results in a more consistent result across a population of valuers, of which the process is clearly communicable and simple to the explain the taxpayer. This process ultimately conforms to the principles of 'good tax design', results in a simpler and more transparent tax while maintaining its economic efficiency.

The additional complexity of valuing land in highly urbanized requires a standard in accounting for the added value of improvements in the absence of vacant land sales. The selection of sales of which improvements are maximally productive and highest and best use is the first important step in the valuation process. This paves the way for the second step of the valuation process to be further explored, that is defining a standard added value of improvements within a designated defined valuation location or catchment.

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ANNEXURE – SUMMARY OF RESULTS

Table 3: Retail Experiment Result Summary

	22 Main Street		20 Main Street		5 Bank Road		15 Main Street	
Sale Price	$900,000		$640,000		$830,000		$860,000	
Land Value Mean Initial Sim	N/a		$566,989		$583,889		$566,467	
Land Value Mean STDEV Initial Experiment	N/a		8.19%		9.79%		10.18%	
Land Value Mean Revised	$542,152		$531,439		$541,939		$549,890	
Land Value Mean STDEV Revised Sim & Add Sale	1.89%		5.97%		6.52%		4.44%	
Land : Improved Value Ratio Revised Mean	60%		83%		65.3%		63.9%	
Age / last upgrade of improvements	1 month		50 years		15 years		7 years	
Size m^2 of improvements	$130m^2$		$130m^2$		$130m^2$		**$130m^2$**	
	Not available in the initial experiment		**20 Main Street**		**5 Bank Road**		**15 Main Street**	
			No	**%**	**No**	**%**	**No**	**%**
Most relevant sale			17	73.9%	0	0	6	26.1%
Least relevant sale			4	17.4%	12	47.8%	7	30.4%
Most valuable location			11	47.8	8	34.8	4	17.4
Valuers who identified most valuable location but did not assign highest land value	**Total No** 7	**Total %** 28	4	17.4%	0	0%	3	13%

25 Responses appear under most valuable location, of which 2 valuers selected 2 properties as being equally most valuable location.

Table 4: Residential Experiment Result Summary

	11 Fiction Street		10 Fiction Street		15 Fiction Street		20 Fiction Street	
Sale Price	$970,000		$785,000		$650,000		$550,000	
Land Value Mean Initial Sim	N/a		$465,676		$459,480		$486,241	
Land Value Mean STDEV Initial Experiment	N/a		17%		16.4%		11.2%	
Land Value Mean Revised	$477,326		$451,863		$448,122		$463,041	
Land Value Mean STDEV Revised Sim & Add Sale	5.6%		10.3%		12.6%		13%	
Land Improved Value Ratio Revised Mean	49.2%		57.6%		68.9%		84.2%	
Age/last upgrade of improvements	New		10 years		Not stated		Not stated	
Size m^2 of improvements	250		230		190		**180**	
	Not available in the initial experiment		**10 Fiction Street**		**15 Fiction Street**		**20 Fiction Street**	
			No	**%**	**No**	**%**	**No**	**%**
Most relevant sale			5	21.7	3	13	15	65.2
Least relevant sale			12	52.2	5	21.7	6	26.1
Most valuable location			3	12	11	44	11	44
Valuers who identified most valuable location but did not assign highest land value	**Total No** 11	**Total %** 47.8%	2	8.7%	5	21.7%	4	17.4%

Non-parametric Levene Test Results

Retail - 15 Main

Non-parametric Levene	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	402.087	1	402.087	11.467	.002
Within Groups	1542.849	44	35.065		
Total	1944.936	45			

Retail - 5 Bank

Non-parametric Levene	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	123.277	1	123.277	2.643	.111
Within Groups	2052.385	44	46.645		
Total	2175.662	45			

Retail - 20 Main

Non-parametric Levene	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	321.723	1	321.723	8.334	.006
Within Groups	1698.610	44	38.605		
Total	2020.333	45			

Residential - 10 Fiction

Non-parametric Levene	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	226.174	1	226.174	5.093	.029
Within Groups	1954.153	44	44.413		
Total	2180.327	45			

Residential - 15 Fiction

Non-parametric Levene	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	161.434	1	161.434	3.993	.052
Within Groups	1778.697	44	40.425		
Total	1940.130	45			

Residential - 20 Fiction

Non-parametric Levene	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	61.065	1	61.065	1.648	.206
Within Groups	1629.893	44	37.043		
Total	1690.958	45			